

CLAIMS

What is claimed is:

1 1. A network receiver configured for receiving a modulated carrier signal from
2 another network transceiver via a network medium, the network receiver comprising:

3 a) an input amplifier for amplifying a received modulated carrier signal
4 according to one of a plurality of amplifier gain settings and outputting an amplified
5 carrier signal;

6 b) an envelope detector configured for outputting an envelope signal in
7 response to the amplified carrier signal;

8 c) a first gain control circuit configured to select a first gain setting in
9 response to the envelope signal, the first gain setting being optimal for receiving a
10 pulse position modulated carrier signal;

11 d) a second gain control circuit configured to select a second gain control
12 setting in response to the envelope signal, the second gain setting being optimal for
13 receiving a quadrature amplitude modulated signal; and

14 e) selection circuitry configured to determine whether the envelope signal
15 represents a pulse position modulated carrier or an amplitude modulated carrier and
16 sets the amplifier gain setting to the first gain setting or a second gain setting
17 respectively.
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1 2. The network receiver of claim 1, further including an analog to digital converter
2 generating a digital carrier signal in response to the amplified carrier signal, the
3 envelope detector responsive to the digital carrier signal.
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1 3. The network receiver of claim 2, further including a Hilbert transformer
2 generating a digital I channel carrier signal and a digital Q channel carrier signal in
3 response to the amplified carrier signal, the envelope detector responsive to the
4 digital I channel carrier signal and the digital Q channel carrier signal.
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1 4. The network receiver of claim 3, wherein the selection circuitry includes a
2 carrier sense circuit for detecting the duration of a power pulse in the envelope
3 signal.

1 5. The network receiver of claim 4, wherein the selection circuitry selects the first
2 gain setting if the duration of a power pulse is less than a duration on the order of a
3 duration of a pulse position modulation power pulse.

1 6. The network receiver of claim 5, wherein the selection circuitry selects the
2 second gain setting if the duration of a power pulse is greater than a duration on the
3 order of a duration of a pulse position modulation power pulse.

1 7. The network receiver of claim 6, wherein the envelope signal represents the
2 square root of the sum of the square of the I channel carrier signal and the square of
3 the Q channel carrier signal.

1 8. The network receiver of claim 7, wherein the first gain control circuit includes a
2 plurality of comparators, each configured to compare the envelope signal with one of
3 a plurality of reference signals and the first gain setting is determined by detecting
4 saturation of at least one comparator when iteratively testing each of the plurality of
5 gain settings.

1 9. The network receiver of claim 8, wherein the second gain control circuit
2 includes a logarithmic look up table generating a log signal representing the envelope
3 signal, a comparator comparing the log signal to a reference signal to generate a
4 difference signal, a multiplier multiplying the difference signal by a loop gain constant
5 to generate a product, and an integrator integrating the product to generate the
6 second gain setting.

1 10. The network receiver of claim 9, wherein the loop gain constant is selected to
2 be a large value for a first portion of a detected power pulse, a smaller value for a
3 second portion of a detected power pulse, and zero for a remaining duration of a
4 detected power pulse.
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1 11. A method of determining a gain setting for an input amplifier generating an
2 amplified carrier signal in a receiver configured for receiving a modulated carrier
3 signal from a network medium, the method comprising:

- 4 a) generating an envelope signal from the amplified carrier signal
5 representing the amplified carrier signal power;
6 b) determining a first gain setting in response to the envelope signal, the
7 first gain setting selected for receiving a pulse position modulated carrier signal;
8 c) determining a second gain setting in response to the envelope signal,
9 the second gain setting selected for receiving a quadrature amplitude modulated
10 carrier signal;
11 d) determining whether the modulated carrier signal is a pulse position
12 modulated carrier or a quadrature amplitude modulated carrier; and
13 e) setting the gain of the input amplifier to the first gain setting if the
14 modulated carrier signal is determined to be a pulse position modulated carrier and
15 setting the input amplifier gain to the second gain setting if the modulated carrier
16 signal is determined to be a quadrature amplitude modulated carrier.
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1 12. The method of claim 11, further comprising converting the amplified carrier
2 signal to a digital carrier signal, the envelope signal being generated from the digital
3 carrier signal.
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1 13. The method of claim 12, further comprising generating an I channel signal and
2 a Q channel signal from the digital carrier signal, the envelope signal being
3 generated from the I channel signal and the Q channel signal.
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14. The method of claim 13, wherein the step of setting the gain of the input amplifier includes detecting the duration of a power pulse in the envelope signal.

15. The method of claim 14, wherein the gain of the input amplifier is set to the first gain setting if the duration of a power pulse is less than a duration on the order of a duration of a pulse position modulation power pulse.

16. The method of claim 15, wherein the gain of the input amplifier is set to the second gain setting if the duration of a power pulse is greater than a duration on the order of a duration of a pulse position modulation power pulse.

17. The method of claim 16, wherein the envelope signal represents the square root of the sum of the square of the I channel signal and the square of the Q channel signal.

18. The method of claim 17, wherein the first gain setting is determined by comparing the envelope signal to a plurality of reference levels and iteratively testing each of the plurality of gain settings for saturation occurring at least one reference level to determine the first gain setting.

19. The method of claim 18, wherein the second gain setting is determined by converting the envelope signal to a log signal representing the envelope signal, comparing the log signal to a reference level to determine a difference, multiplying the difference by a loop gain constant to determine a product, and integrating the product to determined the second gain setting.

20. The method of claim 19, wherein the loop gain constant is selected to be a large value for a first portion of a detected power pulse, a smaller value for a second portion of a detected power pulse, and zero for a remaining duration of a detected power pulse.

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1 21. A network receiver configured for receiving a modulated carrier signal from
2 another network transceiver via a network medium, the network receiver comprising:

3 a) an input amplifier for amplifying a received modulated carrier signal
4 according to one of a plurality of amplifier gain settings and outputting an amplified
5 carrier signal;

6 b) a first gain control circuit for providing a first amplifier gain setting based
7 on a carrier signal modulated in accordance with a first modulation method;

8 c) a second gain control circuit for providing a second amplifier gain
9 setting based on a carrier signal modulated in accordance with a second modulation
10 method;

11 d) a selection circuit for identifying whether the carrier signal is modulated
12 in accordance with the first modulation method or the second modulation method,
13 and for providing a gain control signal to the input amplifier in accordance therewith.
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1 22. The network receiver of claim 21, wherein the selection circuit includes
2 envelop detection circuitry for detecting the duration of a power pulse in the envelope
3 signal.
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1 23. The network receiver of claim 22, wherein the selection circuit provides a gain
2 control signal coupling the first amplifier gain setting to the input amplifier if the
3 duration of a power pulse is less than a duration on the order of a duration of a pulse
4 position modulation power pulse.
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1 24. The network receiver of claim 23, wherein the selection circuit provides a gain
2 control signal coupling the second amplifier gain setting to the input amplifier if the
3 duration of a power pulse is greater than a duration on the order of a duration of a
4 pulse position modulation power pulse.
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